

WESTERN ATLANTIC SERRANID FISHES (GROUPERS) OF THE GENUS *EPINEPHELUS*

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DURING the years 1945-47, the present writer, under a Guggenheim Fellowship, spent several months studying the collections of western Atlantic groupers at the United States National Museum and the Museum of Comparative Zoology. Particular attention was paid to the genus *Epinephelus*, and extensive taxonomic information was obtained. Numerous specimens representing all the presently recognized species of that group were examined. Since that time, material of all the western Atlantic species of *Epinephelus* has accumulated in the collections of the Ichthyological Museum of the University of Miami. Additional information was thus obtained, and during the summer of 1962 I studied the collections of *Epinephelus* at Stanford University. During the past 25 years, I have studied and collected in the field all the western Atlantic species of the genus.

These studies were conducted in connection with a proposed revision but for various reasons publication was delayed. In the mean time Smith (1961), published a synopsis of the western north Atlantic groupers. In addition to biological and other data, his publication includes a key to the species of *Epinephelus* and related genera. Although Smith's work is a valuable contribution to the knowledge of western Atlantic groupers, his key, the only means for identification given, is not satisfactory. One species, *Epinephelus drummondhayi*, was overlooked, and some of the key characters are misinterpreted or misleading. Furthermore, little indication is given of the usually considerable ontogenetic variation of many of these characters. Some of the life color features used by Smith as key characters are of no value in the identification of preserved material.

This paper is intended only as a mean for the identification of the western Atlantic species of *Epinephelus* as restricted by Smith (1961). For positive identification, the key should be used in conjunction with the diagnosis and remarks provided under each species heading. The species diagnoses combine most of the characters used in the key. The same characters, in the same sequence, are given in each diagnosis. Since nearly complete synonymies

and combinations were given by Smith, these will not be repeated in this study.

In the dorsal and anal fin, the last two elements are counted as a single ray split to the base. All pectoral elements are counted. All gill rakers on the first arch are counted, including rudiments; the count for the lower limb includes the gill raker at the angle. Scales are difficult to count accurately and their number contributes little or nothing towards identification. For this reason scale counts have been omitted in this study. Color characters are based on specimens preserved in ethyl alcohol. Other characters are self-explanatory. Lengths are expressed in millimeters and refer to the standard length.

I am grateful to Leonard P. Schultz, United States National Museum, William C. Schroeder, Museum of Comparative Zoology, and George S. Myers, Standard University, for permission to study and report on the material under their care.

Genus *Epinephelus* Bloch

Epinephelus Bloch, 1793, p. 11 (original description). Type species, *E. marginalis* Bloch, 1793.

The following combination of characters distinguishes the western Atlantic species of *Epinephelus* from related genera occurring in the same area.

Dorsal spines 10 or 11. Dorsal rays 13 to 18. Anal spines 3. Anal rays 8 to 10. Pectoral rays 16 to 19. Gill rakers on first arch 13 to 19 (lower limb), 8 to 11 (upper limb), 21 to 28 (total). Supra-maxillary bone present and well developed. Preopercle without a strong antrorse spine at its angle. Pectoral fin not reaching to vertical from origin of anal fin. Caudal fin truncate, rounded or emarginate, not deeply forked.

KEY TO WESTERN ATLANTIC SPECIES OF *Epinephelus*

- 1a. Dorsal rays 13 to 15. Insertion of pelvic fin under or in advance of upper end of pectoral base; conspicuously in advance of lower end of pectoral base. Pelvic fin equal to or longer than pectoral, except in specimens about 400 mm. in length or larger.
- 2a. Dorsal spines 10. Gill rakers 15 or 16, usually 15 on lower limb of first arch. Orbit diameter less than least interorbital width, except in very young specimens about 100 mm. in length or

smaller. Caudal peduncle not conspicuously darker dorsally.

1. *Epinephelus nigrilus*

2b. Dorsal spines 11. Gill rakers 15 to 17, usually 16 on lower limb of first arch. Orbit diameter equal to or greater than least interorbital width, except in specimens about 300 mm. in length or larger. Caudal peduncle conspicuously darker dorsally.

3a. Dorsal rays 15. Posterior nostril 4 to 7 times larger than the anterior. Dusky band present around caudal peduncle but not forming a well-defined saddle-like black blotch dorsally. Dark-barred pattern on sides of body present. No white spots in regular rows on sides of body.

2. *Epinephelus mystacinus*

3b. Dorsal rays 13 to 15, usually 13 or 14. Posterior nostril about as large as the anterior or 3 to 5 times larger. Dusky band absent around caudal peduncle. A dorsal saddle-like black blotch on caudal peduncle gradually disappearing with age; faint or absent in specimens about 300 mm. in length or larger. Dark-barred pattern on sides of body absent. White spots in regular longitudinal and vertical rows on sides of body gradually disappearing with age; faint or absent in specimens about 300 mm. in length or larger.

4a. Posterior nostril about as large as the anterior. Margin of spinous dorsal fin yellow. Dorsal saddle-like black blotch on caudal peduncle, when present (juveniles and young), not extending anteriorly to end of dorsal base or ventrally to lateral line.

3. *Epinephelus flavolimbatus*

4b. Posterior nostril 3 to 5 times larger than the anterior. Margin of spinous dorsal fin dusky. Dorsal saddle-like black blotch on caudal peduncle, when present (juveniles and young), extending anteriorly to end of dorsal base and ventrally to or beyond lateral line.

4. *Epinephelus niveatus*

1b. Dorsal rays 15 to 18, usually 16 or 17. Insertion of pelvic fin under or behind lower end of pectoral base; conspicuously behind upper end of pectoral base. Pelvic fin shorter than pectoral.

5a. Gill rakers 13 to 15, usually 14 on lower limb of first arch. Orbit diameter less than least interorbital width, except in very young specimens about 150 mm. in length or smaller. Fifth dorsal spine less than least depth of caudal peduncle. Color pattern combining irregular dusky cross bars with brown spots. Size large; known to reach about 700 pounds in weight.

5. *Epinephelus itajara*

5b. Gill rakers 15 to 19, usually 16 to 18 on lower limb of first arch. Orbit diameter about equal to or greater than least interorbital width, except in specimens about 200 to 300 mm. in length or

larger. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Color pattern not combining dusky cross bars with brown spots. Size medium to small; not known to reach 100 pounds in weight.

- 6a. Anal rays 9 or 10, usually 9. Posterior margin of caudal fin straight or concave, except in young specimens about 150 mm. in length or smaller.
- 7a. Pectoral rays 18. Gill rakers 17 or 18 on lower limb of first arch. Dorsal fin membrane notched between the spines. No black specks scattered around eye. Head, body, and fins profusely speckled with white spots on a brown background. A dorsal saddle-like black blotch on caudal peduncle. 6. *Epinephelus drummondhayi*
- 7b. Pectoral rays 16 to 18, usually 17. Gill rakers 15 or 16, usually 16 on lower limb of first arch. Dorsal fin membrane not notched between the spines. Black specks scattered around eye present, sometimes confined to preorbital and/or suborbital area. White spots, if present, on sides of body only; absent on head and fins. No dorsal saddle-like black blotch on caudal peduncle. 7. *Epinephelus morio*
- 6b. Anal rays 7 to 9, usually 8. Posterior margin of caudal fin convex.
- 8a. Gill rakers 16 to 19, usually 17 or 18 on lower limb of first arch. Head and body with numerous brown spots on a lighter background. Dark-barred pattern on sides of body absent.
- 9a. Dorsal rays 16 or 17, usually 17. Pectoral rays 19, rarely 18. Spots on ventral area of body larger than those on back. A dorsal saddle-like black blotch on caudal peduncle. Three dark blotches along dorsal fin base. Soft dorsal, anal, and caudal fin not margined with dusky. 8. *Epinephelus adscensionis*
- 9b. Dorsal rays 15 or 16, usually 16. Pectoral rays 17, rarely 16. Spots on ventral area of body not larger than those on back. No dorsal saddle-like blotch on caudal peduncle. No dark blotches along dorsal fin base. Soft dorsal, anal, and caudal fin broadly margined with dusky. 9. *Epinephelus guttatus*
- 8b. Gill rakers 15 to 17, usually 16 on lower limb of first arch. Head and body without numerous brown spots on a lighter background; a few, widely scattered light spots sometimes present on sides of body. Dark-barred pattern on sides of body present or absent.
- 10a. Dorsal rays 16 to 18, usually 17. Posterior nostril

somewhat larger to about twice as large as the anterior. Black specks scattered around eye. Dark-barred pattern on sides of body present. A dorsal saddle-like black blotch on caudal peduncle.

10. *Epinephelus striatus*

- 10b. Dorsal rays 15 or 16. Posterior nostril about as large as the anterior. No black specks scattered around eye. Dark-barred pattern on sides of body absent. No dorsal saddle-like blotch on caudal peduncle.

11. *Epinephelus guaza*1. *Epinephelus nigritus* (Holbrook)

Warsaw grouper; black grouper

Serranus nigritus Holbrook, 1855, p. 173 (original description; Charleston, S. Carolina).

Epinephelus nigritus, Smith, 1961, pp. 3 (characters in key), 11 (listed, synonymy in part; western north Atlantic).

Diagnosis. Dorsal spines 10. Dorsal rays 13 to 15, usually 14. Anal rays 9. Pectoral rays 18 or 19, usually 18. Gill rakers on first arch 15 or 16, usually 15 (lower limb), 9 to 11, usually 9 or 10 (upper limb), 24 to 26, usually 25 (total). Posterior nostril about as large as the anterior or somewhat larger. Orbit diameter less than least interorbital width; greater in very young specimens about 100 mm. in length or smaller. Insertion of pelvic fin conspicuously in advance of upper end of pectoral base. Pelvic fin about equal to or longer than pectoral; shorter in specimens about 500 mm. in length or larger. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex. No black specks scattered around eye. Irregularly scattered white markings sometimes present on sides of body. Dark-barred pattern on sides of body absent. No dorsal saddle-like black blotch on nor dusky band around caudal peduncle.

Remarks. Smith (1961, pp. 2, 3) and most authors before him have misinterpreted the number of dorsal spines in this species. Despite the statements "Dorsal spines usually 11 (sometimes 10 in *Epinephelus nigritus*)", or "Dorsal spines 10 or 11", the many specimens examined by me all had 10 dorsal spines. Perhaps Smith's misinterpretation was caused by his inclusion of *Alphistes scholanderi* Walters (1957) in the synonymy of *Epinephelus nigritus*. As indicated by Walters in his original description and figures, the

posterior nostril is much larger than the anterior in *scholanderi*. Only *Epinephelus mystacinus* and *E. niveatus* have the posterior nostril enlarged. I have compared *scholanderi* with *mystacinus* and *niveatus* and have come to the conclusion that *scholanderi* is a synonym of *niveatus*, not of *nigritus*. The nostrils are about subequal in *Epinephelus nigritus*.

2. *Epinephelus mystacinus* (Poey)

Moustache grouper; cherna del alto

Serranus mystacinus Poey, 1851, p. 52 (original description; Cuba).

Epinephelus mystacinus, Smith, 1961, pp. 4 (characters in key), 11 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 15. Anal rays 9. Pectoral rays 18 or 19. Gill rakers on first arch 15 or 16, usually 16 (lower limb), 8 or 9 (upper limb), 24 or 25 (total). Posterior nostril 4 to 7 times larger than the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 400 mm. in length or larger. Insertion of pelvic fin under or slightly in advance of upper end of pectoral base. Pelvic fin about equal to or longer than pectoral; shorter in specimens about 400 mm. in length or larger. Fifth dorsal spine greater than least depth of caudal peduncle; about equal to or somewhat less in specimens about 450 mm. in length or larger. Posterior margin of caudal fin convex. No black specks scattered around eye. No white spots in regular rows on body or fins. Dark-barred pattern on sides of body present. A dusky band around caudal peduncle much darker dorsally but not forming a well-defined saddle-like black blotch.

Remarks. I do not agree with the name "misty grouper" given to this species by Smith (1961, p. 23). The scientific name *mystacinus* refers to the black, moustache-like band parallel to the upper jaw. For this reason, the name moustache grouper is considered more appropriate for this species.

Smith (1961, p. 4), in his key, attempts to distinguish *mystacinus* from *niveatus* and other species of *Epinephelus* on the basis of the enlarged posterior nostril. He overlooked, however, that in *niveatus* the posterior nostril is also much enlarged and of the size stated by him for *mystacinus*.

3. *Epinephelus flavolimbatus* Poey

Yellowedge grouper; cherna del alto

Epinephelus flavolimbatus Poey, 1865, p. 183 (original description; Cuba).
Smith, 1961, pp. 3 (characters in key), 11 (listed, synonymy; western
north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 13 to 15, rarely 15. Anal rays 9. Pectoral rays 18. Gill rakers on first arch 15 or 16, usually 16 (lower limb), 8 or 9 (upper limb), 24 or 25, usually 24 (total). Posterior nostril about as large as the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 450 mm. in length or larger. Insertion of pelvic fin under or in advance of upper end of pectoral base. Pelvic fin about equal to or longer than pectoral; shorter in specimens about 400 mm. in length or larger. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle; less in specimens about 400 mm. in length or larger. Posterior margin of caudal fin convex in specimens up to about 300 mm. in length; straight or slightly concave in larger individuals. No black specks scattered around eye. Round white spots arranged in regular longitudinal and vertical rows on sides of body; sometimes a row on dorsal fin; these spots gradually disappear with age and are faint to absent in specimens about 300 mm. in length or larger. Dark-barred pattern on sides of body absent. A dorsal saddle-like black blotch on caudal peduncle not extending anteriorly to end of dorsal base or ventrally to lateral line; this blotch gradually disappears with age and is faint to absent in specimens about 300 mm. in length or larger. No dusky band around caudal peduncle.

Remarks. This species resembles *Epinephelus niveatus*, with which it has been confused. Their color patterns are very similar, especially in preserved specimens up to about 300 mm. in length. Up to that size, however, the two species are well distinguished by the extent of the blotch on the back of the caudal peduncle. The coloration of the dorsal fin and the size of the nostrils distinguish the juveniles, young, and larger adults of *flavolimbatus* from those of *niveatus*.

4. *Epinephelus niveatus* (Valenciennes)

Snowy grouper (young); golden grouper (adult); cherna del alto

Serranus niveatus Valenciennes, in Cuvier and Valenciennes, 1828, p. 380 (original description; Brazil).

Epinephelus niveatus, Smith, 1961, pp. 3 (characters in key), 10 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 13 or 14, usually 14. Anal rays 9. Pectoral rays 18, rarely 19. Gill rakers on first arch 15 to 17, usually 16 (lower limb), 8 to 10, usually 8 or 9 (upper limb), 23 to 26, usually 24 or 25 (total). Posterior nostril 3 to 5 times larger than the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 300 mm. in length or larger. Insertion of pelvic fin under or slightly in advance of upper end of pectoral base. Pelvic fin about equal to or longer than pectoral; shorter in specimens about 400 mm. in length or larger. Fifth dorsal spine greater than least depth of caudal peduncle; about equal to or somewhat less in specimens about 400 mm. in length or larger. Posterior margin of caudal fin convex in specimens up to about 300 mm. in length; straight or slightly concave in larger individuals. No black specks scattered around eye. Round white spots arranged in regular longitudinal and vertical rows on sides of body; sometimes a row on dorsal fin; these spots gradually disappear with age and are faint to absent in specimens about 300 mm. in length or larger. Dark-barred pattern on sides of body absent. A dorsal saddle-like black blotch on caudal peduncle extending anteriorly to end of dorsal base and ventrally to or beyond lateral line; this blotch gradually disappears with age and is faint to absent in specimens about 300 mm. in length or larger. No dusky band around caudal peduncle.

Remarks. As already indicated under *Epinephelus nigrilus*, the form described as *Alphestes scholanderi* by Walters (1957) appears to be a synonym of *Epinephelus niveatus* not of *E. nigrilus*. The close resemblance between *niveatus* and *flavolimbatus* was discussed under the latter species.

5. *Epinephelus itajara* (Lichtenstein)

Jewfish; spotted grouper; guasa

Serranus itajara Lichtenstein, 1822, p. 278 (original description; Brazil).

Epinephelus itajara, Smith, 1961, pp. 4 (characters in key), 12 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 15 or 16, usually 16. Anal rays 8. Pectoral rays 19. Gill rakers on first arch 13 to 15, usually 14 (lower limb), 8 or 9, usually 9 (upper limb), 21 to 24 (total). Posterior nostril about equal to or somewhat larger than the anterior. Orbit diameter less than least interorbital width; greater in very young specimens about 150 mm. in length or smaller. Insertion of pelvic fin under or somewhat behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine less than least depth of caudal peduncle. Posterior margin of caudal fin convex. No black specks scattered around eye; the markings on head are brown spots not restricted to area around eye. Head, body, and fins with dark-brown spots. Dark-barred pattern on sides of body present in specimens up to about 1000 mm. in length. No dorsal saddle-like black blotch on caudal peduncle. A dusky band around caudal peduncle in young and half-grown.

Remarks. The fewer gill rakers on the lower limb of the first arch and the color pattern distinguish this species from all other western Atlantic members of the genus. Besides this species, only *Epinephelus adscensionis* and *E. guttatus* are brown-spotted but they have no cross bars. In *E. itajara*, the dark-barred pattern persists in specimens of a size seldom or never reached by *adscensionis* or *guttatus*.

6. *Epinephelus drummondhayi* (Goode and Bean)

Speckled hind; calico grouper

Epinephelus drummondhayi Goode and Bean, 1878, p. 173 (original description; Bermuda and Florida). Smith, 1961, p. 10 (listed; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 15 or 16, usually 16. Anal rays 9. Pectoral rays 18. Gill rakers on first arch 17 or

18 (lower limb), 9 or 10 (upper limb), 26 to 28, usually 27 (total). Posterior nostril about equal to or somewhat larger than the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 200 mm. in length or larger. Insertion of pelvic fin under lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin straight or slightly concave. No black specks scattered around eye. Head, body, and fins profusely speckled with white spots on a brown background. Dark-barred pattern on sides of body absent. A dorsal saddle-like black blotch on caudal peduncle not extending anteriorly to end of dorsal base or ventrally to lateral line. No dusky band around caudal peduncle.

Remarks. This species was listed by Smith (1961, p. 10) but not included in his key. It is distinguished from all the other western Atlantic species of the genus by the unique, striking color pattern. The truncate or emarginate caudal fin is another distinctive character shared only with *Epinephelus morio*.

7. *Epinephelus morio* (Valenciennes)

Red grouper; cherna americana; cherna de vivero

Serranus morio Valenciennes, in Cuvier and Valenciennes, 1828, p. 285 (original description; New York; Santo Domingo).

Epinephelus morio, Smith, 1961, pp. 2 (characters in key), 9 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 16 or 17. Anal rays 9, rarely 10. Pectoral rays 16 to 18, usually 17. Gill rakers on first arch 15 or 16, usually 16 (lower limb), 8 or 9 (upper limb), 23 to 25 (total). Posterior nostril about equal to or somewhat larger than the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 275 mm. in length or larger. Insertion of pelvic fin slightly to conspicuously behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex in young up to about 150 mm. in length; straight or concave in larger individuals. Black specks scattered around eye, sometimes confined to preorbital, suborbital area, or both. White spots sometimes present on

sides of body. Dark-barred pattern on sides of body faint or absent. No dorsal saddle-like black blotch on, or dusky band around caudal peduncle.

Remarks. This is the only western Atlantic species of *Epinephelus* in which the dorsal fin membrane is not notched between the spines. In addition, it is distinguished from the other species, except *E. drummondhayi*, by the truncate or emarginate caudal fin. The fewer pectoral rays and gill rakers, and the color pattern distinguish *morio* from *drummondhayi*.

8. *Epinephelus adscensionis* (Osbeck)

Rock hind; aguají

Trachinus adscensionis Osbeck, 1771, p. 96 (original description; Ascension Island).

Epinephelus adscensionis, Smith, 1961, pp. 4 (characters in key), 11 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 16 or 17, usually 17. Anal rays 8. Pectoral rays 19, rarely 18. Gill rakers on first arch 16 to 19, usually 17 or 18 (lower limb), 7 to 9 (upper limb), 23 to 28, usually 25 to 27 (total). Posterior nostril about equal to the anterior. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 300 mm. in length or larger. Insertion of pelvic fin behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex. No black specks scattered around eye; the markings on head are brown spots not restricted to area around eye. Head, body, and fins with brown spots which are larger on ventral area. Three dark blotches along dorsal fin base. Dark-barred pattern on sides of body absent. A dorsal saddle-like black blotch on caudal peduncle, not extending anteriorly to end of dorsal base or ventrally to lateral line; blotch faint or obsolete in specimens over 300 mm. in length. No dusky band around caudal peduncle.

Remarks. Smith (1961: 4) and several authors before him have stated that in this species there are no scales on the exposed surface of the maxillary. This has frequently been used as a distinguishing character but I have examined specimens with a well-defined patch of scales on the exposed surface of the maxillary.

9. *Epinephelus guttatus* (Linnaeus)

Red hind; cabrilla

Perca guttata Linnaeus, 1758, p. 292 (original diagnosis, after Catesby; America).

Epinephelus guttatus, Smith, 1961, pp. 3 (characters in key), 9 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 15 or 16, usually 16. Anal rays 7 or 8, usually 8. Pectoral rays 17, rarely 16. Gill rakers on first arch 17, rarely 16 (lower limb), 8 or 9, usually 9 (upper limb), 24 to 26 (total). Posterior nostril somewhat larger to about twice as large as the anterior. Orbit diameter about equal to or greater than least interorbital width. Insertion of pelvic fin under or slightly behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex. No black specks scattered around eye; the markings on head are brown spots not restricted to area around eye. Head and body, and sometimes fins, with brown spots which are occasionally faint or absent on ventral area. Dark-barred pattern on sides of body absent. No dorsal saddle-like black blotch on, nor dusky band around caudal peduncle.

Remarks. The "red spots" used by Smith (1961, p. 3) as a distinguishing character for this species and for *Epinephelus adscensionis* refer to life color. These spots turn brown after a relatively short period of preservation in alcohol or formalin.

10. *Epinephelus striatus* (Bloch)

Nassau grouper; cherna criolla

Anthias striatus Bloch, 1792, p. 125 (original description, after figure by Plumier; Atlantic Ocean).

Epinephelus striatus, Smith, 1961, pp. 3 (characters in key), 8 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 16 to 18, usually 17. Anal rays 8. Pectoral rays 18, rarely 17. Gill rakers on first arch 16 or 17, usually 16 (lower limb), 8 or 9, usually 9 (upper limb), 24 to 26, usually 25 (total). Posterior nostril somewhat larger to about twice as large as the anterior. Orbit diameter about equal

to or greater than least interorbital width; less in specimens about 200 mm. in length or larger. Insertion of pelvic fin slightly to conspicuously behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex. Black specks scattered around eye. Dark-barred pattern on sides of body. A dorsal saddle-like black blotch on caudal peduncle, not extending anteriorly to end of dorsal base or ventrally to lateral line. A dusky band, usually split into two, around caudal peduncle.

Remarks. The figure of a 45.6 mm. specimen published by Smith (1961, p. 24) represents a juvenile which does not show the fully developed fins, body shape, or color pattern.

11. *Epinephelus guaza* (Linnaeus)

Groupers; garropa; guasa

Labrus guaza Linnaeus, 1758, p. 285 (original diagnosis; "Pelago").

Epinephelus guaza, Smith, 1961, pp. 3 (characters in key), 13 (listed, synonymy; western north Atlantic).

Diagnosis. Dorsal spines 11. Dorsal rays 15 or 16. Anal rays 8 or 9, usually 8. Pectoral rays 18 or 19. Gill rakers on first arch 15 or 16, usually 16 (lower limb), 8 to 10 (upper limb), 23 to 26 (total). Posterior nostril about as large as the anterior or somewhat larger. Orbit diameter about equal to or greater than least interorbital width; less in specimens about 250 mm. in length or larger. Insertion of pelvic fin under or slightly behind lower end of pectoral base. Pelvic fin shorter than pectoral. Fifth dorsal spine about equal to or greater than least depth of caudal peduncle. Posterior margin of caudal fin convex. No black specks scattered around eye. Irregularly scattered white spots sometimes present on sides of body. Dark-barred pattern on sides of body absent. No dorsal saddle-like black blotch on, nor dusky band around caudal peduncle.

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